

CLAIMS

1. Method for controlling a direct current motor (30) in one or several fan units (43; 20, 21), each comprising a fan, which method comprises:
 - 5 generation of a control signal from a first control unit (22) which is external in relation to the said fan unit (43, 20, 21);
transmission of the said control signal to the said fan unit (43, 20, 21);
reception of the transmitted control signal in the said fan unit (43, 20, 21);
interpretation of the said control signal in a second control unit (26) which is
10 arranged in association with the said fan unit (43, 20, 21); and
generation, in the said second control unit (26), of a supply signal for the said direct current motor (30), on the basis of the control signal generated by the first control unit (22) and received in the fan unit and on the basis of a supply voltage; characterized in that the method further comprises:
 - 15 transmission of the control signal together with the supply voltage over a shared communication link (44), with the control signal being superposed on the supply voltage.
2. Method according to claim 1, characterized in that serial
20 communication is used for transmitting the said control signal to the said fan unit (43, 20, 21).
3. Method according to claim 1 or 2, characterized in that the said control signal is a binary data signal.
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4. Method according to claim 3, characterized in that the said control signal constitutes a measurement of a certain required proportion of the maximal output of the said direct current motor (30) or a certain required speed of rotation of the direct current motor's (30) fan.

5. Method according to any one of the preceding claims, characterized in that the said fan unit (43, 20, 21) is used for ventilation of a vehicle seat (1).
- 5 6. Method according to any one of the preceding claims, characterized in that pulse width modulation (PWM) is used for controlling the said direct current motor (30).
- 10 7. Method according to claim 6, characterized in that the pulse frequency of the said pulse width modulated supply is varied in response to a detected speed of rotation of the said direct current motor (30).
- 15 8. Method according to claim 6 or 7, characterized in that the pulse frequency of the said pulse width modulated supply is equal to or a whole-number multiple or a whole-number fraction of the detected speed of rotation.
- 20 9. Method according to any one of the preceding claims, characterized in that information is communicated from the fan unit (43, 20, 21) to the first control unit (22).
10. Method according to claim 9, characterized in that the said information is communicated via the windings of the direct current motor comprised in the fan unit (43, 20, 21).
- 25 11. Method according to claim 10, characterized in that it comprises generation of current pulses in a predetermined pattern in the windings of the direct current motor, which pattern corresponds to certain information.
- 30 12. Method according to any one of claims 9-11, characterized in that the said information comprises data relating to operating state, fault diagnosis or identification information relating to the fan unit (43, 20, 21).

13. Method according to any one of the preceding claims, characterized in that each fan unit (43, 20, 21) is provided with an identity to make it possible to transmit information between the first control unit (22) and one of several fan units (43, 20, 21).

14. Method according to claim 13, characterized in that it comprises coding of the said control signal in a way such that it reflects information about the said identity.

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15. Method according to any one of the preceding claims, characterized in that the first control unit (22) regulates both the fan unit(s) (43, 20, 21) and the heating element(s) (39, 40).

15 16. Arrangement for controlling a direct current motor (30) in a fan unit (43, 20, 21), which arrangement comprises:

a first control unit (22) that is external in relation to the said fan unit (43, 20, 21);

20 a communication link (44) between the said first control unit (22) and the said fan unit (43, 20, 21);

25 a second control unit (26) arranged in association with the said fan unit (43, 20, 21) and arranged to generate a supply signal for the said direct current motor (30) on the basis of a control signal generated by the first control unit (22) and transmitted via the said communication link (44) and on the basis of a supply voltage;

characterized in that the communication link (44) is arranged to transmit the supply voltage together with the said control signal.

30 17. Arrangement according to claim 16, characterized in that the said communication link (44) is also arranged for serial communication.

18. Arrangement according to claim 16 or 17, characterized in that the said control signal is a binary data signal.

19. Arrangement according to any one of claims 16-18,
5 characterized in that the said fan unit (43, 20, 21) is arranged for ventilation of vehicle seats (1).

20. Arrangement according to any one of claims 16-19,
characterized in that the said fan unit (43, 20, 21) also comprises
10 means (17, 19, 38) for detecting speed of rotation.

21. Arrangement according to any one of claims 16-20,
characterized in that the said fan unit is arranged for control of the
speed of rotation of the direct current motor (30) by means of pulse width
15 modulation.

22. Arrangement according to any one of claims 16-21,
characterized in that the said second control unit (26) is arranged internally in relation to the said fan unit (43, 20, 21).

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23. Arrangement according to any one of claims 16-22,
characterized in that it comprises at least two fan units (43, 20, 21) that are connected either in series or in parallel.

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24. Arrangement according to any one of claims 16-23,
characterized in that it comprises a circuit with a diode (32) and a capacitor (33) that are utilized when supplying the said control signal to the direct current motor (30) while the supply voltage to the direct current motor (30) is maintained.

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25. Method for controlling a direct current motor (30) for a fan (8) arranged for ventilation of a vehicle seat (1), characterized in that the

method comprises controlling the speed of rotation or the output of the said direct current motor (30).

26. Method according to claim 25, characterized in that pulse width modulation (PWM) is used for the said control of the direct current motor (30).

27. Method according to any one of claims 25 or 26, characterized in that the pulse frequency of the said pulse width modulated supply is varied in response to the detected speed of rotation.

28. Method according to any one of claims 25-27, characterized in that the second control unit (26) generates an additional pulse width modulated signal intended for supplying the windings of the direct current motor (30).

29. Method according to claim 28, characterized in that the said additional pulse width modulated signal is variable.

20 30. Arrangement for ventilating a vehicle seat, which arrangement comprises a fan (8), a direct current motor (16, 30) and a control unit (10, 22), characterized in that the said control unit (10, 22) is arranged to control the speed of rotation of the said direct current motor (16, 30).

25 31. Arrangement according to claim 30, characterized in that the said speed of rotation is controlled by the said control unit (10, 22) in response to external stimuli.

30 32. Arrangement according to claim 31, characterized in that the said external stimuli consist of the output signal from a temperature detector (9, 42) arranged in the vehicle seat (1).

33. Arrangement according to any one of claims 30-32, characterized in that the said control of the speed of rotation of the direct current motor is carried out by means of a pulse width modulated supply.

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34. Vehicle seat (1) characterized in that it is equipped with an arrangement according to any one of claims 16-24 or 30-34.

35. Method for diagnosis and control of a direct current motor (30) in a fan unit (43, 20, 21) with a fan, which method comprises:

10 a control unit (26) arranged in association with the said direct current motor (30) for controlling the speed of rotation or output of the said direct current motor (30), with

15 a supply signal for the said direct current motor (30) being received in the said control unit;

characterized in that the method comprises;

generation of a diagnostics signal from the control unit (26) arranged in association with the said direct current motor (30); and

transmission of the said diagnostics signal to an additional control unit (22)

20 which is external in relation to the said fan unit (43, 20, 21).

36. Method according to claim 35, characterized in that the said diagnostics signal is transmitted in the form of a predetermined pattern in the current that is supplied to the windings of the said direct current motor (30).

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